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Test report

244089TRFICFCC

Date of issue: October 2, 2013

Applicant:
Inpeco Spa a Socio Unico
Via Giuseppe di Vittorio,11 - 20090 Segrate (Milano) -Italy

Product: Radio Frequency Identification Device for Sample carriers

Model: CANBUS ANTENNA Model variant: N/A

FCC ID: Y2K-CANBUSGW002 IC Registration number: 11394A-CANBUSGW002

Specifications:

- FCC 47 CFR Part 15 Subpart C
  Intentional radiators
- RSS-210, Issue 8, December 2010, Section 2.5
  General field strength limits

Test location

Company name:	Nemko SpA
Address:	Via del Carroccio 4
City:	Biassono
Province:	MB
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Telephone:	+39 039 2201201
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Toll free:	
Website:	www.nemko.com
Site number:	FCC: 481407 IC: 9109A-1

Tested by:	Curioni Gabriele, Wireless/EMC Specialist
Reviewed by:	Barbieri. Paolo, Wireless/EMC Specialist
Date:	September 19, 2013
Signature:	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko SpA accreditation.

Copyright notification

Nemko SpA. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name:	Inpeco Spa
Address:	Via Giuseppe Di Vittorio 11
City:	Segrate
Province/State:	Milano
Postal/Zip code:	20090
Country:	Italy

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C	Intentional radiators
RSS-210, Issue 8, Section 2.5	General field strength limits

1.3 Test methods

ANSI C64.3 v 2003	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.207(a)	Conducted limits	Pass
§15.31(e)	Variation of power source	Pass[1]
§15.203	Antenna requirement	Pass[2]
§15.209	Radiated emission limits; general requirements.	Pass

Notes: [1] Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. No noticeable output power variation was observed

[2] The Antennas are located within the enclosure of EUT and not user accessible.

2.2 IC RSS-GEN, Issue 3, test results

Part	Test description	Verdict
4.6.1	Occupied bandwidth	Pass
4.7	Transmitter frequency stability	Pass
6.1	Receiver spurious emissions limits (radiated)	Pass
6.2	Receiver spurious emissions limits (antenna conducted)	Pass
7.2.4	AC power lines conducted emission limits	Pass

Notes: [1] According to Notice 2012-DRS0126 (from January 2012) section 2.2 of RSS-Gen, Issue 3 has been revised. The EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

2.3 IC RSS-210, Issue 8, test results

Part	Test description	Verdict
2.5	General field strength limits	
2.5.1	Transmitters with Wanted Emissions that are Within the General Field Strength Limits	Pass

Notes: None

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	September 10, 2013
Nemko sample ID number	244089

3.2 EUT information

Product name	Radio Frequency Identification Device for Sample carriers
Model	CANBUS ANTENNA
Model variant	None
Serial number	None

3.3 Technical information

Operating band	0.009-0.490 MHz
Operating frequency	125 kHz
Modulation type	ASK
Occupied bandwidth (99 %)	562 Hz
Emission designator	562HM1D
Power requirements	24 Vdc
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator.

3.4 Product description and theory of operation

Radio Frequency Identification Device for Sample carriers composed by tag reader and Canbus Controller

Transmission frequency 125 kHz, ASK modulation, 24V power supply.

3.5 EUT exercise details

NA

3.6 EUT setup diagram

PCF7991 Philips, driver converting digital data from a micro controller to analogue signal ready for transmission and viceversa.

Support antennas

Ferrite Brand FAIR-RITE type 0431164281 (coil cable)

Transponder PCF7935AS, PCF7935AA, PCF7931AS

Figure 3.6-1: Setup diagram

3.7 EUT sub assemblies

See 3.6

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar (hPa)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Nemko Canada Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 "Uncertainty in EMC measurements." Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.

Test	Range	Measurement Uncertainty	Notes
Radiated Disturbance	Antenna distance 3m, 10m (30÷200) MHz	5.0 dB	(1)
	Antenna distance 3m (0.2÷6) GHz	5.2 dB	(1)
	Antenna distance 1m, 3m (6÷18) GHz	5.8 dB	(1)
	Antenna distance 1m, 3m (18÷40) GHz	7.2 dB	(1)
Conducted Disturbance	9 kHz ÷ 150 kHz with AMN	3.8 dB	(1)
	150 kHz ÷ 30 MHz with AMN	3.4 dB	(1)
	150 kHz ÷ 30 MHz with AAN	4.6 dB	(1)
	9 kHz ÷ 30 MHz with voltage probe	2.9 dB	(1)
	9 kHz ÷ 30 MHz with current probe	2.9 dB	(1)
Clicks	9 kHz ÷ 150 kHz	3.8 dB	(1)
	150 kHz ÷ 30 MHz	3.4 dB	(1)
Disturbance Power	30 MHz ÷300 MHz	4.5 dB	(1)
Frequency	10 Hz ÷ 1 kHz	0.2%	(1)
	1kHz ÷ 40GHz	10^{-6}	(1)
Harmonic Current Emission	50 Hz ÷ 2 kHz	2%	(1)
Voltage Fluctuation Emission	--	2%	(1)
Radiated Immunity	20 MHz ÷ 3 GHz	2.8 dB	(1)
Conducted RF Immunity	9 kHz ÷ 230 MHz	3.0 dB	(1)
ESD Immunity	Amplitude	10%	(1)
Burst Immunity	Amplitude	10%	(1)
	Duration	30%	
Surge Immunity	Amplitude	10%	(1)
	Front Time	20% or 30%	
	Half Value	20% or 30%	
Dips Immunity	Amplitude	5%	(1)
	Duration	5%	
Magnetic Field Immunity	50 Hz	2.0dB	(1)
Damped Magnetic Field Immunity	100 kHz, 1 MHz	3 dB ampl. 10% freq.	(1)
Oscillatory Wave Immunity	Amplitude - 100 kHz, 1 MHz	10%	(1)
	Front Time - 100 kHz, 1 MHz	20%	(1)
	Oscillation frequency - 100 kHz, 1 MHz	10%	(1)
Low Frequency Immunity	15 Hz ÷ 150 kHz	2.2 dB	(1)

NOTES:
(1) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2 which has been derived from the assumed normal probability distribution with infinite degrees of freedom and for a coverage probability of 95 %

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: Equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
Antenna Loop	Rohde & Schwarz	HM 020	836 950/006	10/2012	10/2014
EMI Receiver	Rohde & Schwarz	ESU8	100202	02/2013	02/2014
Semi-anechoic chamber	Nemko S.p.a.	10m Semi-anechoic chamber	503	10/2012	08/2014
Shielded room	Siemens	10m control room	1947	Not subject to calibration	
Spectrum analyzer	Rohde & Schwarz	FSEK	848 255/005	08/2013	08/2014
Field meter	PMM	8053+EP330	0022V90523+ 101	11/2012	11/2013
V Network	Rohde & Schwarz	ESH2-Z5	872 460/041	9/2013	9/2014
Antenna Loop	Eaton	94605-1	0267	8/2013	8/2015
EMI Receiver	Rohde & Schwarz	ESCI	100888	8/2013	8/2014
Antenna trilog 25MHz-8GHz	Schwarzbeck	VULB 9162	9162-025	05/2012	05/2915
automatic positioning system antenna	Rohde & Schwarz	HCM	836 529/05	NCR	
Rotating table	Rohde & Schwarz	HCT	835 803/03	NCR	

Note: NCR - no calibration required, VOU - verify on use

Section 8. Testing data

8.1 FCC 15.207(a) and RSS-Gen 7.2.4 AC power line conducted emissions limits

8.1.1 Definitions and limits

FCC:
Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

IC:
The purpose of this test is to measure unwanted radio frequency currents induced in any AC conductor external to the equipment which could conduct interference to other equipment via the AC electrical network.

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

The conducted emissions shall be measured with a 50 Ω/50 µH line impedance stabilization network (LISN).

Table 8.1-1: Conducted emissions limit

Frequency of emission, MHz	Conducted limit, dBµV	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Note: * - Decreases with the logarithm of the frequency.

8.1.2 Test summary

Test date:	September 16, 2013	Temperature:	Choose temperature °C 25.8
Test engineer:	Gabriele Curioni	Air pressure:	Select air pressure mbar 974
Verdict:	Pass	Relative humidity:	Select humidity59

8.1.3 Observations, settings and special notes

The EUT was set up as tabletop configuration.

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

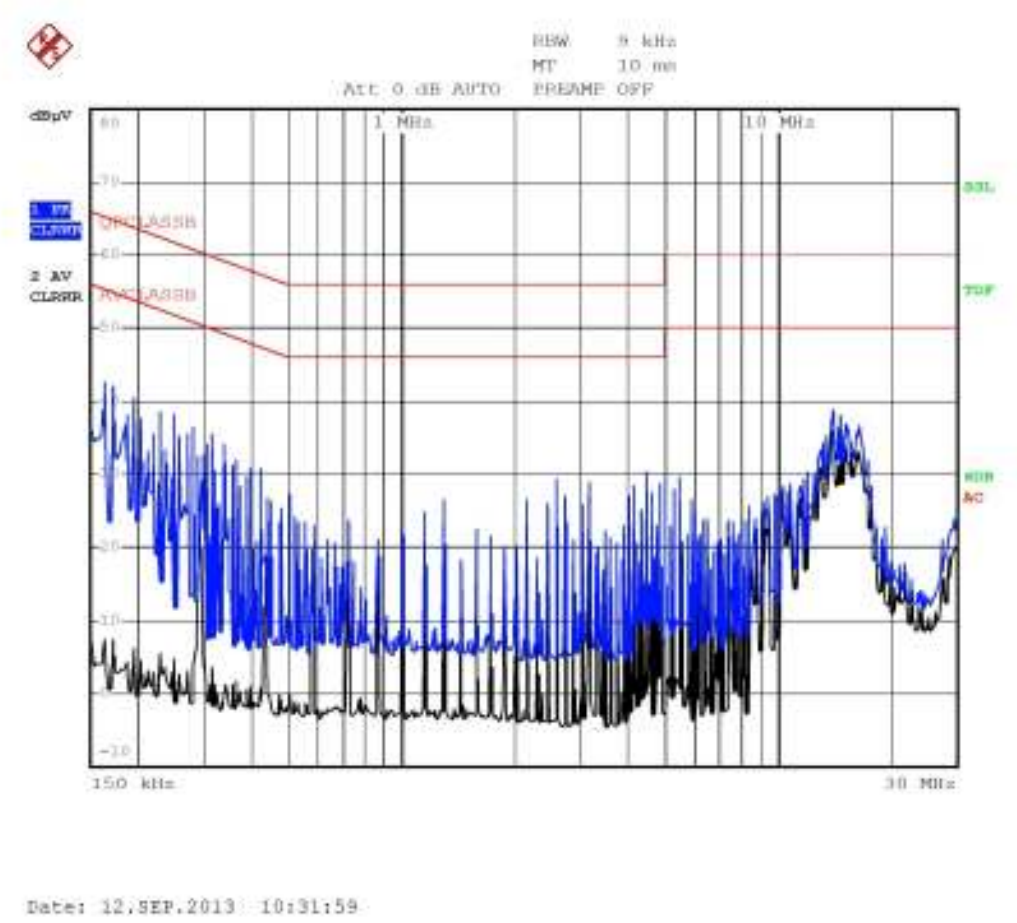
Receiver settings for preview measurements:

Resolution bandwidth:	9 kHz
Video bandwidth:	30 kHz
Detector mode:	Peak and Average
Trace mode:	Max Hold
Measurement time:	1000 ms

Receiver settings for final measurements:

Resolution bandwidth:	9 kHz
Video bandwidth:	30 kHz
Detector mode:	Quasi-Peak and Average
Trace mode:	Max Hold
Measurement time:	1000 ms

8.1.4 Test data



Plot 8.1-1: Conducted emissions on phase line

Table 8.1-2: Quasi-Peak conducted emissions results on phase line

data less than 20 dB of bounds

Frequency, MHz	Q-Peak result, dBµV	Meas. Time, ms	Bandwidth, kHz	Filter	Correction, dB	Margin, dB	Limit, dBµV

Note: 43.5 dBµV = 23.2 dBµV (receiver reading) + 10.1 dB (LISN factor IL) + 0.2 dB (cable loss) + 10 dB (attenuator)

data less than 20 dB of bounds

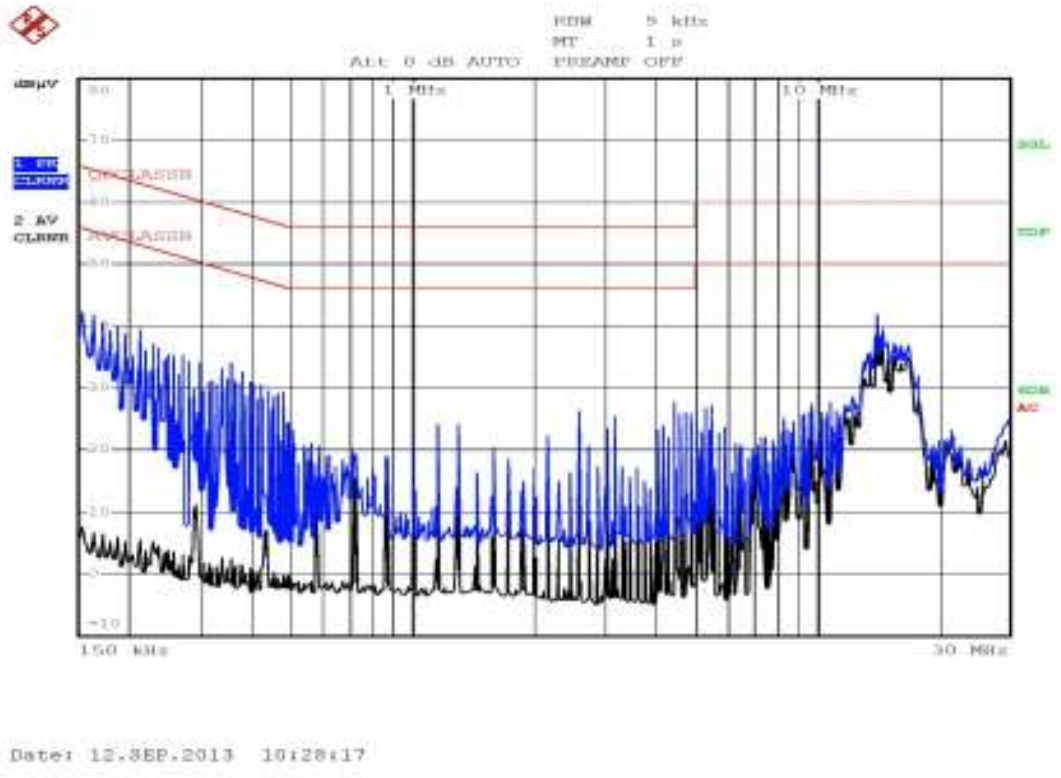
Table 8.1-3: Average conducted emissions results on phase line

Frequency, MHz	Average result, dBµV	Meas. Time, ms	Bandwidth, kHz	Filter	Correction, dB	Margin, dB	Limit, dBµV

Sample calculation:
Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)
Result (dBµV) = XX dBµV (reading from receiver) + XX dB (Correction factor)

Example:
43.5 dBµV = 23.2 dBµV (receiver reading) + 10.1 dB (LISN factor IL) + 0.2 dB (cable loss) + 10 dB (attenuator)

8.1.4 Test data, continued



Plot 8.1-2: Conducted emissions on neutral line

data less than 20 dB of bounds

Table 8.1-4: Quasi-Peak conducted emissions results on neutral line

Frequency, MHz	Q-Peak result, dBµV	Meas. Time, ms	Bandwidth, kHz	Filter	Correction, dB	Margin, dB	Limit, dBµV

Note: 43.5 dBµV = 23.2 dBµV (receiver reading) + 10.1 dB (LISN factor IL) + 0.2 dB (cable loss) + 10 dB (attenuator)

data less than 20 dB of bounds

Table 8.1-5: Average conducted emissions results on neutral line

Frequency, MHz	Average result, dBµV	Meas. Time, ms	Bandwidth, kHz	Filter	Correction, dB	Margin, dB	Limit, dBµV

Sample calculation:
Correction factor (dB) = LISN factor IL (dB) + cable loss (dB) + attenuator (dB)
Result (dBµV) = XX dBµV (reading from receiver) + XX dB (Correction factor)

Example:
43.5 dBµV = 23.2 dBµV (receiver reading) + 10.1 dB (LISN factor IL) + 0.2 dB (cable loss) + 10 dB (attenuator)

8.2 RSS-Gen 4.6.1 Occupied bandwidth

8.2.1 Definitions and limits

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 percent emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recorded frequencies is the occupied bandwidth.

8.2.2 Test summary

Test date:	September 16, 2013	Temperature:	Choose temperature °C 25.0
Test engineer:	Gabriele Curioni	Air pressure:	Select air pressure mbar 976
Verdict:	Pass	Relative humidity:	Select humidity 59

8.2.3 Observations, settings and special notes

Spectrum analyser settings:

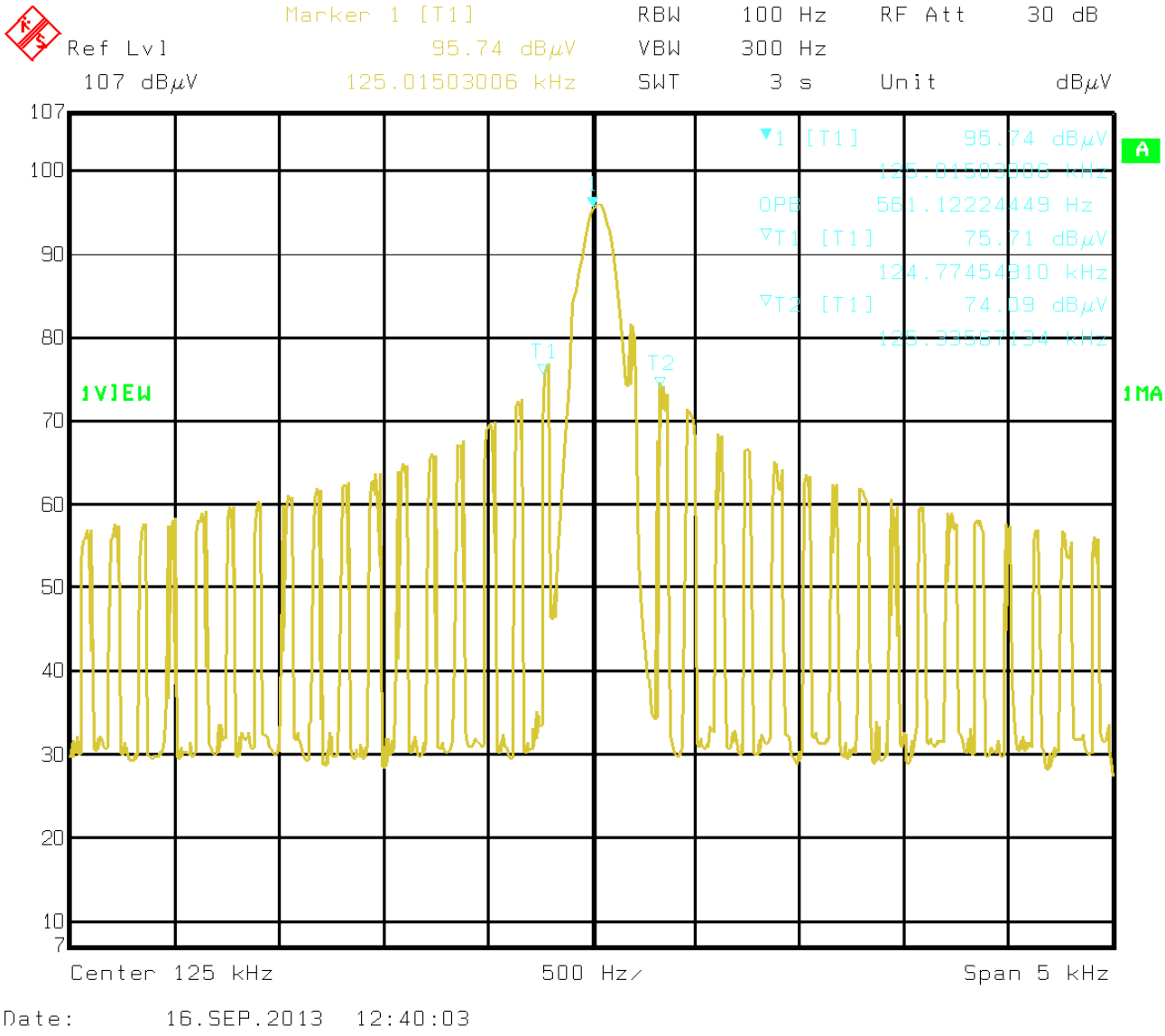
Resolution bandwidth:	≥1 % of span
Video bandwidth:	≥3 × RBW
Detector mode:	Peak
Trace mode:	Max Hold

8.2.4 Test data

Table 8.2-1: 99 % bandwidth results

Modulation	99 % bandwidth, MHz
ASK	**561 Hz**

8.2.4 Test data, continued



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8.3 FCC 15.209(a) and RSS-210, 2.5 Radiated emissions limits

8.3.1 Definitions and limits

FCC:

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the Table 8.3-1 below.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

IC:

RSS-Gen includes the general field strength limits of unwanted emissions, where applicable, for transmitters and receivers operating in accordance with the provisions specified in this standard.

Unwanted emissions of transmitters and receivers are permitted to fall within the restricted bands listed in RSS-Gen, and including the TV bands, but fundamental emissions are prohibited in the restricted bands bands.

Whether or not their operation is addressed by published RSS standards, transmitters whose wanted and unwanted emissions are within the general field strength limits shown in RSS-Gen, they may operate in any of the frequency bands, other than the restricted bands listed in RSS-Gen and including the TV bands, and shall be certified under RSS-210. Under no conditions may the level of any unwanted emissions exceed the level of the fundamental emission.

Note: Devices operating below 490 kHz in which all emissions are at least 40 dB below the limit listed in RSS-Gen (General Field Strength Limits for Transmitters at Frequencies below 30 MHz) are Category II devices and are subject to RSS-310.

Table 8.3-1: FCC §15.209 and RSS-Gen – Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.
For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

8.3.1 Definitions and limits, continued

Table 8.3-2: IC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677-5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8
8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in Table 8.3-2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

8.3.2 Definitions and limits, continued

Table 8.3-3: FCC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

8.3.3 Test summary

Test date:	September 17, 2013	Temperature:	Choose temperature °C 27.2
Test engineer:	Gabriele Curioni	Air pressure:	Select air pressure mbar 979
Verdict:	Pass	Relative humidity:	Select humidity 60.1

8.3.4 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
EUT was set to transmit with 100 % duty cycle.
Radiated measurements were performed at a distance of 3 m, the EUT was transmitting on both MIMO chains simultaneously.
Since fundamental power was tested using average method, the spurious emissions limit is −30 dBc/100 kHz

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

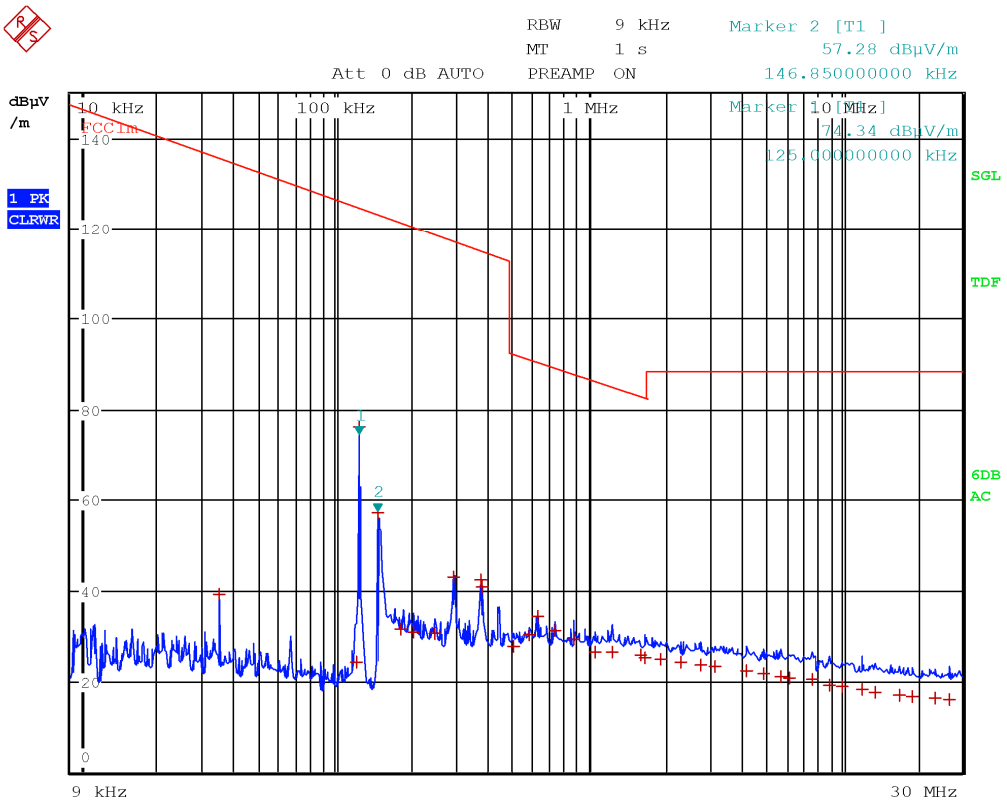
Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for conducted spurious emissions measurements:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

8.3.4 Test data



Date: 27.SEP.2013 12:32:29

Quasi-Peak DATA ----1 meter Distance.

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC1m		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	34.65 kHz	39.16	-96.73
1 Quasi Peak	120.65 kHz	24.10	-100.96
1 Quasi Peak	125 kHz	76.23	-48.52
1 Quasi Peak	146.85 kHz	57.19	-66.16
1 Quasi Peak	182.5 kHz	31.46	-90.00
1 Quasi Peak	202.5 kHz	30.74	-89.82
1 Quasi Peak	245 kHz	30.53	-88.38
1 Quasi Peak	292.5 kHz	42.99	-74.38
1 Quasi Peak	375 kHz	42.35	-72.86
1 Quasi Peak	377.5 kHz	40.73	-74.42
1 Quasi Peak	505 kHz	27.57	-65.08
1 Quasi Peak	585 kHz	30.07	-61.40
1 Quasi Peak	625 kHz	34.11	-56.83
1 Quasi Peak	735 kHz	31.10	-58.54
1 Quasi Peak	872.5 kHz	29.01	-59.26
1 Quasi Peak	1.055 MHz	26.29	-60.45
1 Quasi Peak	1.2375 MHz	26.33	-59.13
1 Quasi Peak	1.6075 MHz	25.54	-57.83
1 Quasi Peak	1.6825 MHz	25.01	-57.99
1 Quasi Peak	1.9325 MHz	24.68	-63.81

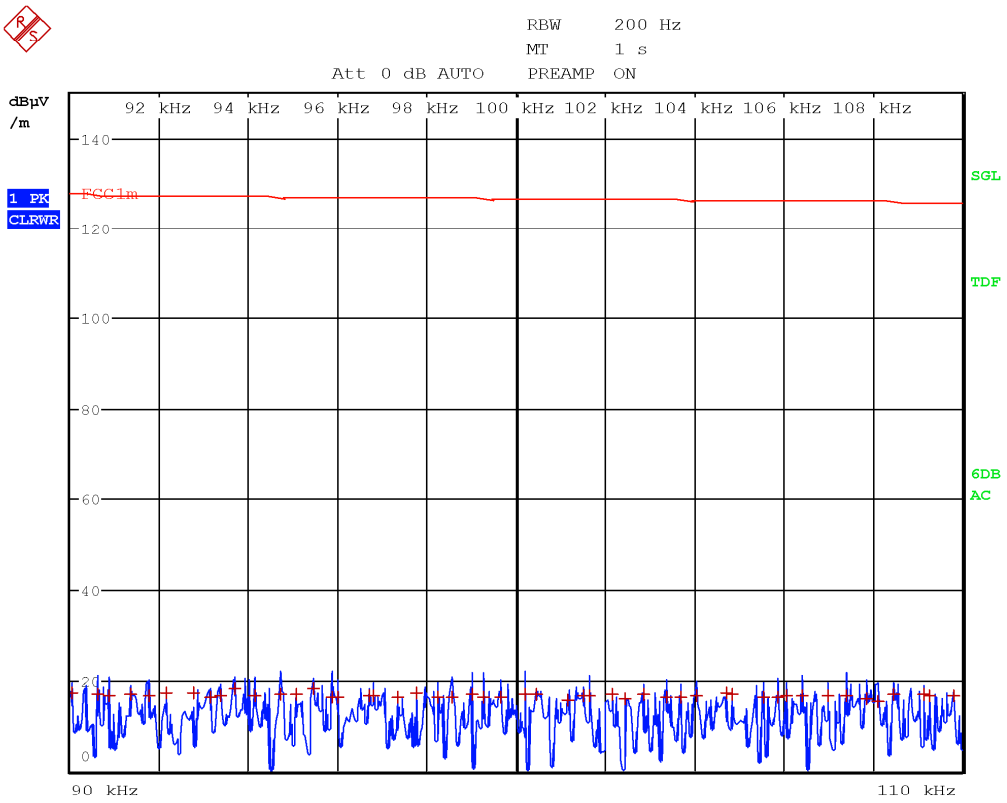
Date: 27.SEP.2013 12:28:30

Table1 FOLLOWS

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC1m		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	2.3075 MHz	24.25	-64.24
1 Quasi Peak	2.7775 MHz	23.59	-64.90
1 Quasi Peak	3.175 MHz	23.13	-65.37
1 Quasi Peak	4.1925 MHz	22.15	-66.35
1 Quasi Peak	4.9325 MHz	21.70	-66.79
1 Quasi Peak	5.7525 MHz	20.93	-67.56
1 Quasi Peak	6.2175 MHz	20.79	-67.70
1 Quasi Peak	7.6475 MHz	20.40	-68.09
1 Quasi Peak	8.9075 MIz	19.10	69.39
1 Quasi Peak	10.0675 MHz	18.86	-69.63
1 Quasi Peak	12.09 MHz	18.08	-70.41
1 Quasi Peak	13.5875 MHz	17.62	-70.87
1 Quasi Peak	16.905 MHz	16.97	-71.52
1 Quasi Peak	19.065 MHz	16.66	-71.83
1 Quasi Peak	23.565 MHz	16.24	-72.25
1 Quasi Peak	26.7975 MHz	16.05	-72.44

Date: 27.SEP.2013 12:30:12

Table2



Date: 27.SEP.2013 12:46:33

LORAN restricted band 90-110 kHz Quasi-Peak

Quasi-Peak data

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC1m		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	90.05 kHz	17.05	-110.55
1 Quasi Peak	90.6 kHz	16.99	-110.56
1 Quasi Peak	90.85 kHz	16.60	-110.92
1 Quasi Peak	91.35 kHz	17.00	-110.48
1 Quasi Peak	91.75 kHz	16.49	-110.94
1 Quasi Peak	92.15 kHz	17.14	-110.26
1 Quasi Peak	92.75 kHz	17.06	-110.28
1 Quasi Peak	93.15 kHz	16.36	-110.95
1 Quasi Peak	93.35 kHz	16.57	-110.72
1 Quasi Peak	93.7 kHz	17.97	-109.28
1 Quasi Peak	94.15 kHz	16.54	-110.67
1 Quasi Peak	94.7 kHz	16.88	-110.29
1 Quasi Peak	95.05 kHz	16.89	-110.25
1 Quasi Peak	95.45 kHz	18.18	-108.92
1 Quasi Peak	95.85 kHz	16.28	-110.78
1 Quasi Peak	96 kHz	16.29	-110.76
1 Quasi Peak	96.7 kHz	16.56	-110.42
1 Quasi Peak	96.8 kHz	16.60	-110.38
1 Quasi Peak	97.35 kHz	16.20	-110.73
1 Quasi Peak	97.75 kHz	17.09	-109.79

Date: 27.SEP.2013 12:42:17

Table1 FOLLOWS

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC1m		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	98.25 kHz	16.34	-110.51
1 Quasi Peak	98.55 kHz	16.25	-110.57
1 Quasi Peak	99 kHz	16.78	-110.00
1 Quasi Peak	99.25 kHz	16.19	-110.57
1 Quasi Peak	99.65 kHz	16.29	-110.44
1 Quasi Peak	100.2 kHz	16.87	-109.81
1 Quasi Peak	100.45 kHz	16.72	-109.93
1 Quasi Peak	101.15 kHz	15.64	-110.95
1 Quasi Peak	101.5 kHz	16.66	-109.90
1 Quasi Peak	101.65 kHz	16.40	-110.15
1 Quasi Peak	102.15 kHz	16.71	-109.80
1 Quasi Peak	102.45 kHz	15.96	-110.52
1 Quasi Peak	102.85 kHz	16.92	-109.53
1 Quasi Peak	103.35 kHz	16.36	-110.04
1 Quasi Peak	103.7 kHz	16.20	-110.17
1 Quasi Peak	104.05 kHz	16.62	-109.73
1 Quasi Peak	104.7 kHz	17.03	-109.27
1 Quasi Peak	104.85 kHz	16.86	-109.42
1 Quasi Peak	105.55 kHz	16.24	-109.99
1 Quasi Peak	105.85 kHz	16.36	-109.84

Date: 27.SEP.2013 12:43:10

Table2 FOLLOWS

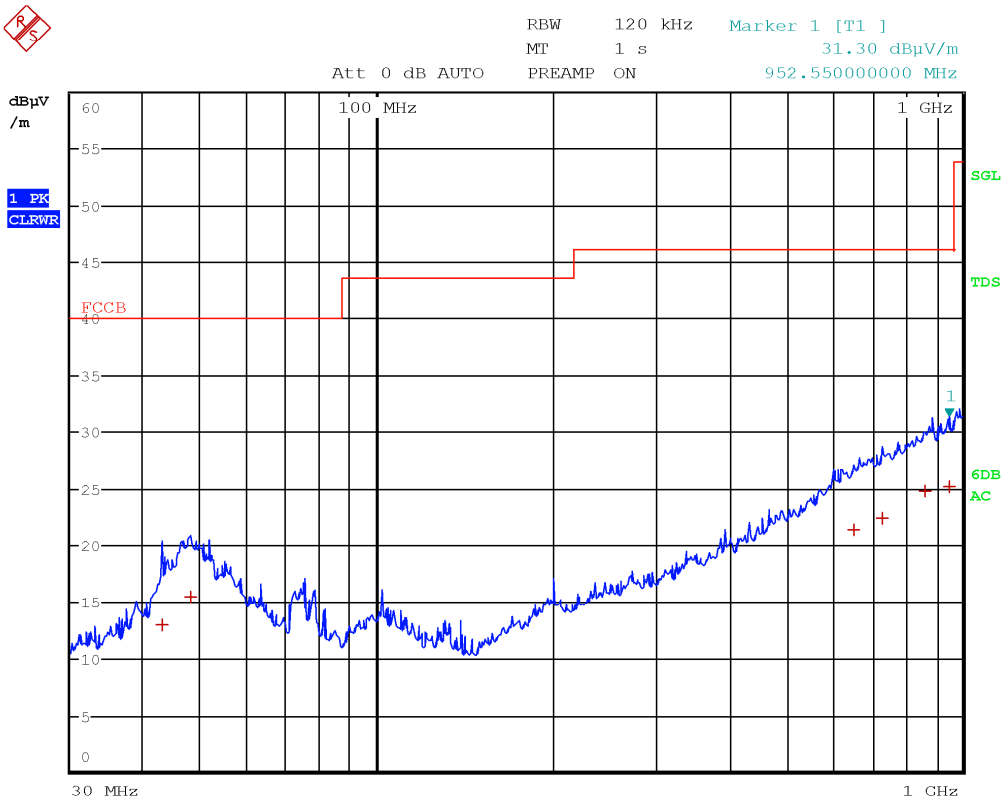
EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCC1m
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	106.05 kHz	16.40	-109.78
1 Quasi Peak	106.4 kHz	16.49	-109.66
1 Quasi Peak	107 kHz	16.45	-109.65
1 Quasi Peak	107.4 kHz	16.41	-109.66
1 Quasi Peak	107.85 kHz	15.97	-110.06
1 Quasi Peak	108.1 kHz	15.30	-110.72
1 Quasi Peak	108.45 kHz	16.86	-109.13
1 Quasi Peak	109.15 kHz	16.80	-109.13
1 Quasi Peak	109.25 kHz	16.52	-109.41
1 Quasi Peak	109.8 kHz	16.61	-109.27

Date: 27.SEP.2013 12:44:49

Table3.



Date: 2.OCT.2013 07:41:34

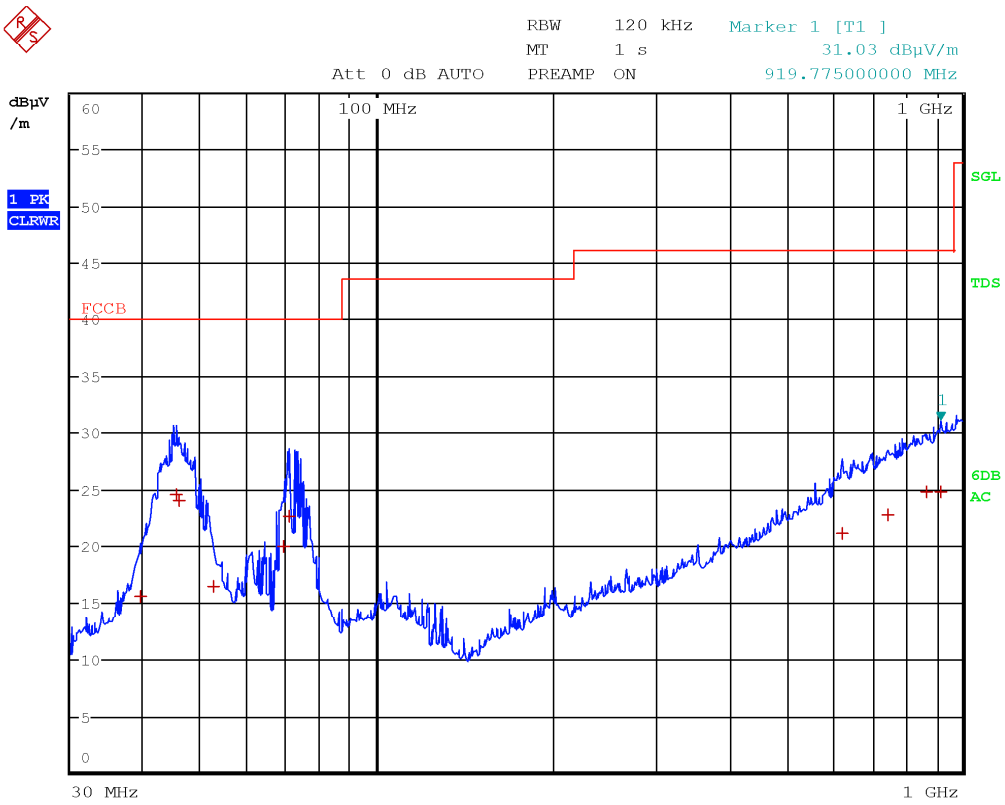
Horizontal Polarization

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	43 MHz	12.86	-27.13
1 Quasi Peak	47.975 MHz	15.43	-24.56
1 Quasi Peak	651.45 MHz	21.39	-24.62
1 Quasi Peak	729.2 MHz	22.41	-23.60
1 Quasi Peak	865.35 MHz	24.72	-21.30
1 Quasi Peak	952.55 MHz	25.12	-20.89

Date: 2.OCT.2013 07:40:35



Date: 2.OCT.2013 07:32:36

Vertical Polarization

EDIT PEAK LIST (Final Measurement Results)

Trace1:	FCCB
Trace2:	---
Trace3:	---

TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	39.425 MHz	15.51	-24.48
1 Quasi Peak	45.55 MHz	24.50	-15.49
1 Quasi Peak	46.075 MHz	23.97	-16.02
1 Quasi Peak	52.625 MHz	16.46	-23.53
1 Quasi Peak	69.55 MHz	19.97	-20.02
1 Quasi Peak	70.875 MHz	22.57	-17.42
1 Quasi Peak	623.65 MHz	21.06	-24.95
1 Quasi Peak	747.45 MHz	22.72	-23.30
1 Quasi Peak	868.25 MHz	24.72	-21.29
1 Quasi Peak	919.775 MHz	24.78	-21.23

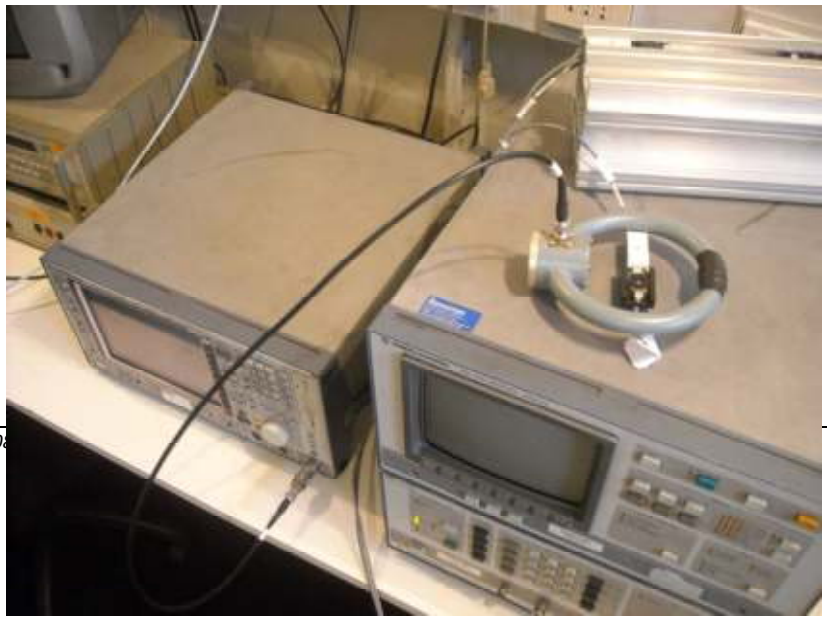
Date: 2.OCT.2013 07:31:29

SETUP PHOTOS

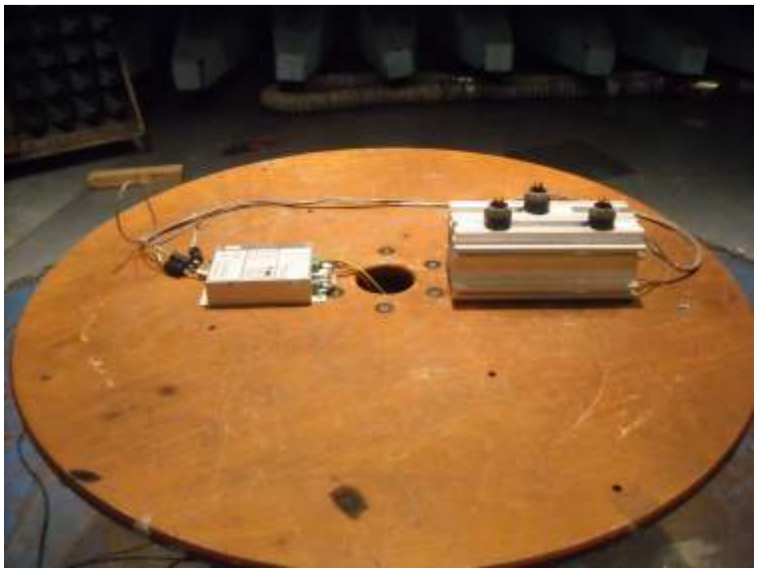
Conducted emissions by V network R&S model ESH2-Z5 +

Receiver R&S model ESCI

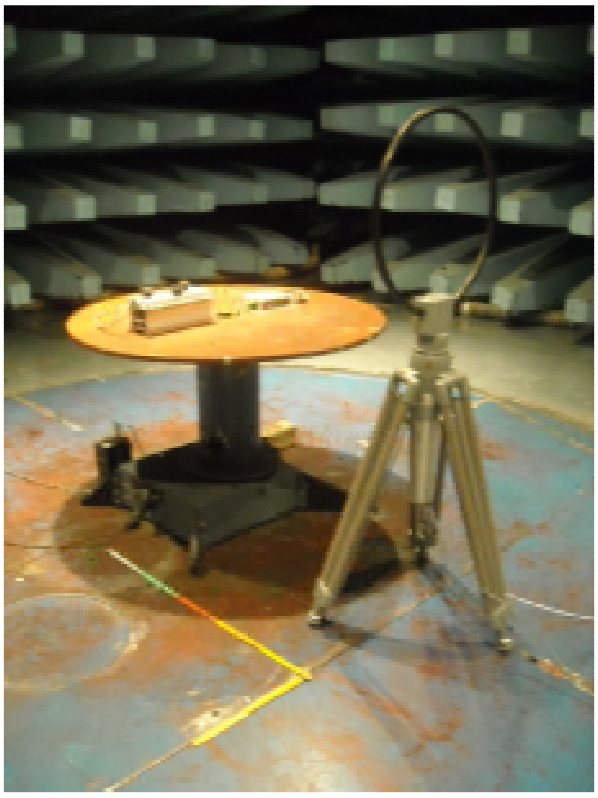
OPB by FSEK R&S + 5-1/4” loop antenna EATON model 94605-1

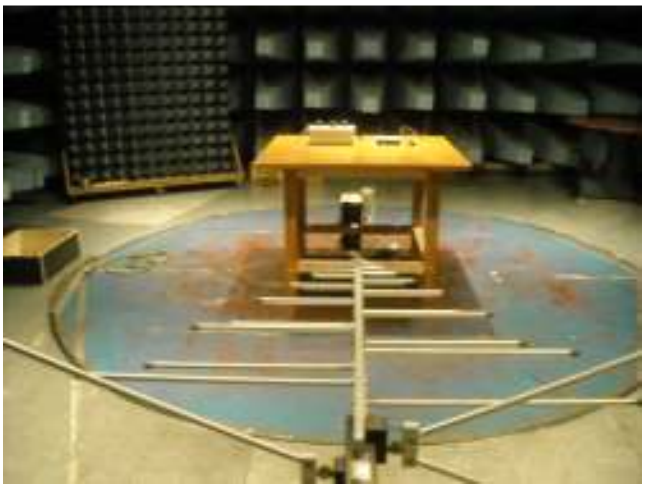


Loop antenna Rohde & Schwarz HM 020
1 meter distance



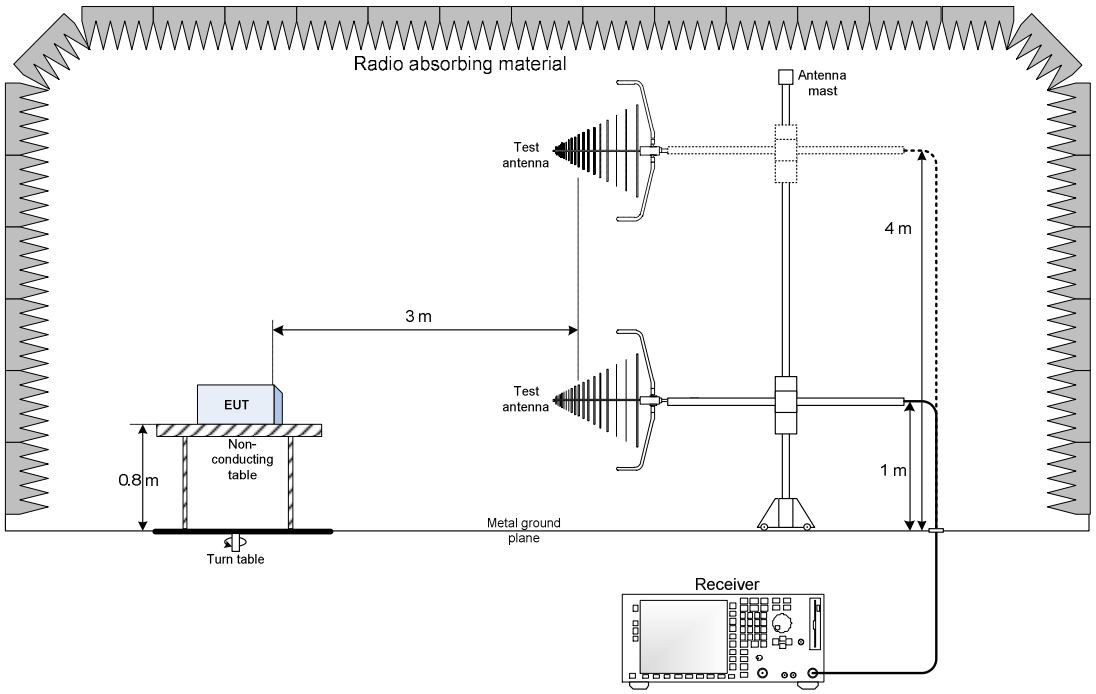
1 meter distance





Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up



9.2 Conducted emissions set-up